AMENDMENT TO THE ABSTRACT

In response to the objection at page 2 of the Office Action that the application lacks an Abstract, a separate sheet containing an Abstract accompanies this Response. The Abstract is taken from the corresponding PCT publication WO0033625.

REMARKS

1. **Page 2 of the Office Action: Rejection of Claim 28 under 35 USC §112**

Claim 28 is amended to obviate the rejection.

2. **Pages 2-4 of the Office Action: Rejection of Claims 31-33 under 35 USC §102 in view of U.S. Patent 5,989,653 to *Chen et al.* and U.S. Patent 3,949,121 to *Kenney***

These rejections are mooted by the cancellation of claims 31-33.

3. **Pages 4-5 of the Office Action: Rejection of Claims 34-35 under 35 USC §102 in view of U.S. Patent 4,759,970 to *Seeger, Jr. et al.***

Claim 34 is amended to recite the presence of an antioxidant, which is noted at page 7 lines 22-25 of the corresponding PCT publication WO0033625. As noted by this passage, the antioxidant prevents auto-oxidation of the resin, which is important in the claimed ink because it will be lithographically printed (and thus printed in very thin layers), and might dry too quickly (e.g. on the transfer roll) without an antioxidant. There is no suggestion to include an antioxidant in the *Seeger, Jr. et al.* ink because there is no apparent advantage to doing so; it is not applied in thin layers and thus is not prone to auto-oxidation. Additionally, the *Seeger, Jr. et al.* ink is dried or "thermally cured" by heating it to drive off a high boiling point solvent (column 7 lines 18-25, see also column 5 line 63-column 6 line 21 and column 10 lines 43-49). The solvent, having a high boiling point, is not sufficiently volatile to significantly dry out at standard temperatures, and thus there is no need to add an antioxidant (particularly since the antioxidant would then hinder the thermal drying process).

4. **Pages 5-6 of the Office Action: Rejection of Claims 1-2, 20, 22-23 and 28 under 35 USC §102 in view of U.S. Patent 5,989,653 to *Chen et al.***

These rejections require reconsideration because *Chen et al.* does not disclose the recited process. *Chen et al.* describes the process of:

(1) catalyst application to a substrate (column 2 line 57-column 3 line 3),

(2) catalyst activation by lithography to generate metal nucleation "clusters" (column 4 line 63-column 5 line 20), and

(3) electroless plating onto the clusters (column 5 lines 21-62), and

(4) subsequent electrolytic plating onto the electroless layer (column 5 line 63 onward).

The examiner cites column 2 lines 15-18 and column 5 lines 10-20 as teaching the use of "lithographic printing." However, while the use of *lithography* is noted, *lithographic printing* is not taught or suggested. Note that the term "lithographic" can refer to classical lithographic printing, sometimes referred to as offset lithography, where printing occurs by exploiting the surface chemistry of a printing plate or other "master": the master bears a hydrophobic image area which repels (polar) water and accumulates (nonpolar) inks, and also bears a hydrophilic background area which is wetted with water so as to repel ink. The master is dampened with water, then ink, with the ink adhering to the image area and the water to the background area. The image on the master is then taken up by an intermediary (generally a rubber blanket or roll), which then transfers the image to the final substrate. However, "lithography" can also refer to "new" lithography: optical, UV, or X-ray lithography, wherein light (or other electromagnetic waves) are shaped by masks or other tools to burn a desired pattern onto a substrate. The claim 1 plainly refers to lithographic printing, i.e., "classical" lithography; see, e.g., page 3 lines 13-17 of the corresponding PCT publication WO0033625:

> The term "lithographic printing" referred to herein is a printing process which utilizes differences in surface chemistry of the printing plate, including hydrophilic and hydrophobic properties. It does not refer to the commonly used process involving photoresist and etching occurring during the production of etched circuit boards and/or silicon semiconductor microelectronics.

Looking then to col. 2 lines 13-18 of *Chen*, it is plain that *Chen* is referring *not* to the Applicant's lithographic *printing*, but rather to "new" lithography:

> Metallic clusters can be formed in the remaining catalyst layer by **irradiating the substrate with suitable electromagnetic radiation**. Masks, lithographic processes, or optical focusing can provide precision control of the cluster formation, allowing subsequent metallization steps to realize high density features.

(Emphasis added.) Thus, there is no teaching of "lithographic printing" as claimed, nor is there any objectively ascertainable suggestion that it would be beneficial to form a seeding layer by lithographic printing. *Chen* instead discusses using "new" lithography to alter the properties of a seeding layer *after* it has been formed. Since *Chen* neither teaches the claimed method, nor can it fairly be said that there is any suggestion in *Chen* or the other references of record that *Chen*'s method should be beneficially modified to obtain the Applicant's claimed method, it is submitted that all claims are allowable in view of *Chen*.

5. Pages 5-6 of the Office Action: Rejection of Claims 1-2, 20, 22-23 and 28 under 35 USC §102 in view of U.S. Patent 3,949,121 to *Kenney*

These rejections also require reconsideration. The process described in *Kenney* is also quite different from the one claimed, but owing to the use of some similar steps (though used on different structures for different purposes), careful attention is required to appreciate the differences between *Kenney* and the claimed process. *Kenney* describes:

(1) Selection of a substrate (column 3 lines 40-51).

(2) Wetting a surface 71 of the substrate 70 with wetting solution 72 (Fig. 1, column 3 line 52-column 5 line 63), rendering surface 71 hydrophilic.

(3) Irradiating the substrate 70 to render it hydrophobic (column 5 line 64-column 6 line 17), perhaps after applying a mask 73 (Fig. 2, column 6 lines 18-47) so that a hydrophobic pattern 71(a) is created (also column 7 lines 25-49).

(4) Wetting the hydrophilic areas 71(b) and inking the hydrophobic areas 71(a)/78, thereby creating a master which is then inked for later printing (Fig. 3, column 6 line 48-68). Thus, note that in *Kenney*, the substrate 70 is itself a printing master.

(5) The ink may be conductive (column 7 lines 1-20), and where conductive ink is used, the conductive ink pattern on the master may then be metallized via electroplating (column 7 lines 20-24), or alternatively via electroless processes followed by electroplating processes (column 7 lines 50-63, also see column 7 line 64-column 9 line 14). Thus, note that the conductive layer is formed on the printing master formed from substrate 70, not on a separate substrate.

The *Kenney* process therefore does not amount to the one of claim 1 unless:

(1) The *Kenney* substrate 70/master was then used as a master in a lithographic printing process to apply a seeding layer of ink to another substrate, and then subsequently treating the seeding layer with an electroless process. However, these steps are not taught, nor are they suggested; what would be the advantage of doing so?

OR

(2) The *Kenney* substrate 70/master *itself* was regarded as being the substrate recited in claim 1. However, claim 1 recites that the seeding layer is lithographically printed on the substrate (that is, applied by an intermediary which has had the ink pattern transferred to it by contact with a lithographic master). The *Kenney* substrate 70/master does not meet this requirement, since its ink seeding layer is applied directly, and therefore there is no anticipation. Additionally, there is no suggestion of utilizing an intermediary to apply the layer to *Kenney*, particularly since this would add further procedural steps and expense to the *Kenney* process with no apparent benefit.

It is therefore submitted that claim 1 (and its dependent claims 2 and 19-30) are both novel and unobvious in view of *Kenney*. However, if the rejections are maintained, please review the bases for the rejections and provide further detail; in some cases the stated bases for the rejections are not understood, or do not appear relevant. For example, for claim 20, the Examiner cites column 3 lines 40-51, but these do not appear to contain a true disclosure of the claimed matter, and column 5 lines 22-23, which do not appear relevant at all. For claim 28, the Examiner's citation of column 7 lines 18-24 appears to be incorrect because it relates to electroplating.

6. Pages 7-13 of the Office Action: 35 USC §103(a) Rejections

These rejections are moot in view of the arguments above, i.e., since claim 1 is both novel and unobvious in view of U.S. Patent 5,989,653 to *Chen et al.* and U.S. Patent 3,949,121 to *Kenney*, and thus the claims rejected here (which depend from claim 1) should be allowable.

7. In Closing

If any questions regarding the application arise, please contact the undersigned attorney. Telephone calls related to this application are welcomed and encouraged. The Commissioner is authorized to charge any fees or credit any overpayments relating to this application to deposit account number 18-2055.

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ATTACHMENTS:

- Abstract
- PTO-2038